

March 11, 2002

Shirley J. Conard
Arizona Department of Environmental Quality
3033 N. Central Avenue (M0401A-422)
Phoenix, AZ 85012-2809

Dear Ms. Conard:

The U. S. Environmental Protection Agency (EPA) has reviewed the revised proposed impaired waters rule. We have coordinated with EPA Headquarters in developing these comments. As discussed in our comments on the first version of the proposed rule (letter dated October 4, 2001), EPA reviews and comments on state methodologies for developing CWA Section 303(d) lists, but does not take formal action of these methodologies. However, EPA is required to take action on the listing decisions Arizona will make later in 2002 based on the methodology in this rule.

We appreciate your efforts to address the concerns raised in our comments on the earlier proposed rule. We believe the inclusion of a list of waters to be monitored helps to ensure that waters with some evidence of impairment receive monitoring attention in the near future, and helps to justify the relatively stringent 303(d) listing criteria. Several of our past concerns have been adequately addressed because the revised rules more clearly provide ADEQ with discretion to make exceptions to certain assessment criteria in particular situations. However, we remain concerned that several rule provisions may result in listing decisions that do not meet CWA and associated federal regulatory requirements. Enclosure 1 to this letter discusses outstanding issues of concern in more detail. Enclosure 2 is our October 4, 2001 comment letter, which we are incorporating by reference since most of the issues it raises are germane to the revised listing rule. Enclosure 3 is a letter from EPA Region 4 to the State of Florida concerning Florida's impaired waters rule. This letter is enclosed because it is referenced in our comments on Arizona's proposed rule.

The revised rule addresses some of EPA's prior concerns about some elements of the listing process including (1) procedures for reviewing data for quality and representativeness, (2) the weight of evidence approach to considering multiple lines of evidence, (3) provisions for not listing impaired waters due to the presence of other required controls; and (4) procedures for setting priority rankings. The language in these sections of the revised rule appears to provide adequate flexibility to facilitate decision making which is consistent with federal listing requirements. It will be important for ADEQ to provide thorough documentation with the listing submission that shows how these procedures were followed and how federal listing requirements have been satisfied.

We would like to follow up with ADEQ to clarify how listing assessments and judgments will be documented in the listing submission to EPA prior to preparation of the listing package.

Several other rule provisions either appear to conflict with federal listing requirements, are too vague to enable us to assess their consistency with federal requirements, or have not been supported by an adequate technical rationale. These provisions include:

- statistical methods for analyzing data sets for certain pollutant types, and particularly for acute standards,
- procedures for assessing exceedences of numeric water quality standards, and particularly standards for toxic pollutants,
- procedures for applying narrative standards and non-traditional water quality data and information,
- exemptions from the assessment process,
- provisions for assessing and listing threatened waters, and
- delisting provisions.

As discussed in our prior comments, it may be that ADEQ has the flexibility to apply some of these provisions in a manner which is consistent with federal listing requirements. We look forward to working with ADEQ to better understand exactly how these rules will be applied in specific situations, and learning the more detailed technical rationales underlying several of the proposed review criteria. We understand that ADEQ wants to move forward quickly with a final rule in order to meet the October 2002 list submission deadline. However, we believe it is very important for EPA and ADEQ to carefully review EPA's outstanding concerns about the rule and clarify whether and how these concerns can be addressed prior to the preparation of the 303(d) list and priority ranking. By working together to specifically identify listing issues that have been resolved as well as unresolved issues, both agencies can more efficiently focus our efforts in the coming months, with the shared goal of developing a 2002 Section 303(d) list that meets both State and Federal requirements.

I look forward to discussing these comments with you. Thank you for your hard work on the rule package and for the opportunity to comment on the revised rule.

Sincerely,

/original signed by/

Alexis Strauss
Director
Water Division

Cc: Karen Smith
Linda Taunt

Enclosure 1: Remaining EPA Concerns About the Revised Impaired Waters Rule

Elements of the rule which may be inconsistent with federal requirements include:

- statistical methods for analyzing data sets for certain pollutant types, and particularly for acute standards,
- procedures for assessing exceedences of numeric water quality standards, and particularly standards for toxic pollutants,
- procedures for applying narrative standards and non-traditional water quality data and information,
- exemptions from the assessment process,
- provisions for assessing and listing threatened waters, and
- delisting provisions.

These comments are organized in terms of these categories. For purposes of brevity, these comments do not address minor wording and comment issues and questions. We will provide follow-up comments that detail these more minor questions or concerns.

Statistical Methods for Analyzing Data For Different Pollutants

EPA remains concerned about several provisions for interpreting available data, including sections addressing statistical outliers and use of measures of central tendency.

Statistical Outliers

We are concerned that Section 603(4)(c) provides for exclusion of data shown to be "statistical outliers". Standard statistical methods do not recommend the exclusion of apparent outliers without a strong scientific basis. EPA's "Guidance for Data Quality Assessment" (EPA/600/R-96/084, available at http://www.epa.gov/quality/qa_docs.html) states that:

"One should never discard an outlier based solely on a statistical test. Instead, the decision to discard an outlier should be based on some scientific or quality assurance basis. Discarding an outlier from a data set should be done with extreme caution, particularly for environmental data sets, which often contain legitimate extreme values. If an outlier is discarded from the data set, all statistical analysis of the data should be applied to both the full and truncated data set so that the effect of discarding observations may be assessed. If scientific reasoning does not explain the outlier, it should not be discarded from the data set." (EPA/600/R-96/084, p. 4-26).

The rule provisions for addressing statistical outliers should be revised consistent with this guidance. We recommend a procedure which uses the statistical methods described in the EPA guidance cited above, carefully documents the prospective consequences of discarding outliers (by analyzing data sets with and without the

outliers), and provides a robust scientific basis for any decision to discard outliers from consideration in the listing assessment.

Measures of Central Tendency

As discussed in our prior comments, we are also concerned that Section 603(7)(a) requires the application of the appropriate measure of central tendency for the datasets for several pollutants for which applicable state water quality standards are expressed as single sample maximums or four day averages. Datasets for these pollutants should be evaluated based on the maximum values for the datasets. Alternatively, we would expect ADEQ to explain in the final rule or the list submittal how the proposed use of measures of central tendency to characterize these standards is consistent with applicable water quality standards.

Procedures for Assessing Numeric Standards Exceedences

The revised rule modifies several aspects of the assessment process from the first proposed rule:

- the minimum sample size for 303(d) listings is increased from 10 to 20,
- a monitoring list is created to track waters with some evidence of impairment which do not meet 303(d) listing thresholds, and
- the provision for listing toxic pollutants based on less than 10 samples and 10% exceedence rate has been deleted and instead proposed as a basis for placing waters on the monitoring list.

Minimum Sample Size

The revised rule raises the minimum sample size for conducting 303(d) listing assessments to 20 samples. This approach appears to be inconsistent with the recommendations of the Florida researchers whose report is cited in the preamble as providing the technical basis for Arizona's binomial approach. The Florida report recommends a minimum sample size of 10 (Lin, et al., October 2000, p. 15). The preamble also cites Smith, et al., 2001; however, the authors of this study conclude only that below sample sizes of about 20, neither the binomial or more traditional "raw score" approaches fully address decision error rates (Smith, et al., p. 612). In any event, the proposed Arizona rule provides no specific analytical rationale for its choice of minimum sample size. In its listing submission, ADEQ will need to provide a more detailed rationale for its binomial approach, including its reliance on a minimum sample size of 20 samples. Moreover, ADEQ will need to describe its basis for not listing waters on the 303(d) list with evidence of pollutant impairment based on less than 20 samples. Please see our more detailed comments on this issue in our October 4, 2001 letter.

Monitoring List

We understand that ADEQ has proposed the monitoring list approach to help ensure that potentially impaired waters are targeted for monitoring. EPA supports the inclusion of a monitoring list in the proposal but do not believe its inclusion fully compensates for several 303(d) listing provisions that appear to be inconsistent with federal listing requirements.

Criteria for Listing Toxic Pollutants

We are very concerned about the deletion of the provision in the previous draft rule that would enable listing of toxic pollutants based on a limited number of exceedences, regardless of sample size. The revised rule now makes this provision a basis for water body inclusion only on the monitoring list. Instead, waters would have to meet the binomial listing test in order to be listed for toxic pollutants, a provision that is inconsistent with EPA national guidance. EPA did not approve of Florida's similar proposed approach of applying a 10% exceedence frequency in evaluating toxic pollutant exceedences (EPA letter to Jerry Brooks, April 27, 2001, p. 4). Therefore, we are concerned that this provision appears to be inconsistent with federal listing requirements and applicable Arizona water quality standards.

EPA remains concerned about several other rule provisions that were contained in the prior proposal, including the binomial assessment approach, and expectation that exceedences would need to be recurring or seasonal in order for a water to be listed.

Binomial Assessment Approach

Neither the preamble nor the rule provide a careful description of the statistical basis for the specific choices made by Arizona with respect to the design characteristics of its binomial 303(d) listing and monitoring list approaches. We urge ADEQ to develop a technical support document or more detailed rule preamble that fully describes the analytical basis for its approach to numeric standards assessments. Such a description will be required as a part of the 303(d) list assessment pursuant to the provisions of 40 CFR 130.7(b).

In the revised preamble, ADEQ acknowledges that its binomial assessment approach is based on an approach to managing type I and type II error that is different than recommended in EPA's draft CALM guidance (2001). However, the preamble does not describe why the Arizona approach is reasonable or consistent with sound statistical practice. In addition, EPA remains concerned about the application of a 10% exceedence rate as the basis for binomial tests. We reviewed the EPA guidance cited in the preamble as recommending listing of waters where conventional pollutants exceed standards in more than 10% of samples. That document provides guidance on methods for deriving aquatic life criteria and is not a water quality assessment guidance document. We do not believe the document makes the recommendation suggested in the preamble. EPA's most recent Section 305(b) assessment guidance generally recommends finding that

waters which exceed conventional standards more than 10% of the time be considered partially supporting of the aquatic life use (EPA, 1997). However, as discussed in more detail in our October 4, 2001 guidance, this is not the same as applying a 10% exceedence rate through a binomial test. The practical effect of applying a 10% exceedence rate through a binomial test is that far more than 10% of the samples need to exceed the standard in order to consider the water body impaired. For example, for a sample size of 20, 25% of samples would have to exceed standards in order to determine that the water body is impaired. This result appears to be inconsistent with EPA's 1997 guidance. Please see our October 4, 2001 comments for more detailed discussions of these concerns.

Persistent, Recurring, or Seasonal Exceedences

The provision in Section 605 that standards exceedences need to be persistent, recurring, or seasonal in order to list a waterbody is not supported with a technical or legal rationale, and appears to be inconsistent with federal listing requirements and applicable Arizona water quality standards. We are aware of no provision in State standards that limits applicability of standards to these circumstances or requires their showing in order to find a water body out of compliance. We also remain concerned by the implication in the weight of evidence section that waters that are shown to exceed one element of standards (e.g., numeric criteria) might not be listed unless there are other lines of evidence confirming the apparent impairment. Please refer to the more detailed discussion of these concerns in our October 4, 2001 letter.

Reliance on Florida Listing Approach

We understand that ADEQ also adopted the monitoring list approach and modified the binomial approach minimum sample thresholds in part to more closely emulate the listing approach adopted by Florida. ADEQ staff have indicated that it believes its revised assessment approach should be acceptable because EPA generally endorsed the Florida listing methodology. Although EPA Region 4 indicated that the Florida listing methodology is generally consistent with federal listing requirements, Arizona's methodology is substantially different from Florida's methodology. EPA Region 4 reviewed the Florida methodology as an entire package, taking into account the technical aspects of the listing methodology, the State's existing monitoring program, and the State's commitment to future monitoring. Florida went to great lengths to document the analytical and statistical basis for its listing methodology by contracting with statisticians to assist in developing and documenting the statistical methods used. EPA found that Florida had made an extremely strong commitment to monitoring the waters on the new monitoring list in the near future and to use preexisting STORET data in its assessment process. Florida's procedure also provides for listing of toxic pollutants due to exceedences of acute standards if there is more than one exceedence in any 3 year period. Moreover, Florida's delisting procedure helps ensure that previously listed waters will not be removed from the 303(d) list simply because the minimum data requirements were not met.

Arizona's proposed listing approach differs from Florida's in important ways. Florida decided to accept existing STORET data as valid for the 2002 listing cycle because it relies on STORET for most of its assessment data and because the State did not want to unreasonably exclude existing data from consideration. Arizona's proposed listing rule is not clear about whether and how STORET data would be considered, but appears to presume the data must meet the data quality and data representativeness criteria in Section 602. Although the Arizona rule provides the flexibility to accept data that does not meet every quality assurance and representativeness test, there is no assurance that existing STORET data will be accepted and used for the 2002 listing assessment.

Arizona's proposed rule does not include a separate binomial testing provision for considering potential delistings of waters on a prior 303(d) list, a provision that Florida adopted. We understand that ADEQ believes such a provision would be inconsistent with Arizona's credible data law. However, it would be reasonable to argue that Florida's delisting approach is no more stringent than its listing approach in that it applies the same binomial statistical test but essentially reverses the null hypothesis based on prior credible information to inform the basis for the assessment null hypothesis. From a statistical analysis standpoint, Florida's delisting approach is less stringent than its listing approach because it sets a lower confidence level to permit delisting (85%) than it does for listings (90%). This delisting approach is consistent with established statistical practice (see Lin, et al, 2000 and Smith, et al., 2001) and appears to make fuller use of available data and information in the listing process. Since we understand ADEQ is unlikely to incorporate a separate delisting test as Florida did, we simply observe that the Arizona approach may be less environmentally protective as a result.

Arizona's listing methodology has no provision for Section 303(d) listing toxic pollutants due to exceedences of acute standards except through the binomial assessment approach. Florida's methodology provides for 303(d) listings if acute toxic pollutant standards are exceeded more than once in 3 years (see attachment to letter from EPA to Jerry Brooks, April 27, 2001, p. 4).

We note these details about the Florida approach in comparison to the Arizona approach to illustrate that each State listing approach has unique characteristics and that the two approaches are not identical. EPA is obliged to consider each element of a State's listing methodology within the unique context of that State's overall water quality assessment approach. Arizona's approach is more stringent than Florida's in some ways in less stringent than others. Therefore, in its 303(d) listing submission, EPA expects Arizona to describe in detail the analytical basis for its assessment methodology.

Procedures for Applying Narrative Standards and Non-Traditional Data and Information

The revised rule continues to suggest that narrative standards cannot be applied unless implementation procedures have been formally adopted. As described in our

October 4, 2001 comments, this prohibition conflicts with federal listing requirements. Please see our October 4, 2001 comments for further discussion of this concern.

The revised rule provides no specific direction concerning the collection and analysis of non-traditional data and information sources (e.g. sediment, tissue, physical, and biological data and information). These data and information sources must be considered in the listing process if they are existing and readily available (see 40 CFR 130.7(b)). The preamble appears to acknowledge that these types of information may be more discriminating than traditional water column data in some circumstances, but the rule does not explain how these data and information sources will be considered.

Exemptions from Coverage By the Rule

As discussed in our earlier comments, Arizona water quality standards do not appear to exempt from coverage waters to which the exceptions referenced in Section 604(C)(2) apply. While the activities referenced in this section may not be subject to regulation as pollutant sources that would receive TMDL allocations and associated control expectations, the receiving waters themselves would have to be listed if applicable water quality standards are exceeded. We would like to understand the basis for interpreting water quality standards to allow the exceptions from listing created by this section.

Threatened Waters

Current federal regulations require listing of waters that will not attain water quality standards in the near future. This interpretation is consistent with national listing guidance, including the recent "2002 Integrated Water Quality Monitoring and Assessment Report Guidance" (November 19, 2001). The proposed rule should be revised to provide for the listing of threatened waters.

Delisting Provisions

We remain concerned that the delisting provisions in Section 605(E) are too vague. The State's rationale for the separate delisting section is unclear and should be described more clearly. We are also concerned that Section 605(E)(1)(f) describes a new natural sources exclusion that appears to be inconsistent with the existing natural sources exclusion contained in Arizona's approved water quality standards. If Arizona intends to modify its water quality standards through the impaired waters rulemaking, these standards changes would need to be submitted to EPA for approval before they are effective. We are very concerned that the provision in this segment would lead the State to essentially ignore human-caused pollutant loadings to some waters simply because natural background loading levels are relatively high. The State should clarify if and how this provision would be applied in practice, and how it is consistent with applicable standards.